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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/805,240	03/14/2001	Hideki Kambara	HIRA.0011	1304

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EXAMINER	
LEWIS, PATRICK T	

ART UNIT	PAPER NUMBER
1623	

DATE MAILED: 11/17/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/805,240	KAMBARA ET AL.	
	Examiner	Art Unit	
	Patrick T. Lewis	1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18,20,21 and 24-26* is/are pending in the application.

4a) Of the above claim(s) *1,2,11-14 and 24-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-10,15-18,20 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention II (claims 3-10 and 15-23) in Paper No. 4 dated October 9, 2002 is acknowledged.

2. Claims 1-2, 11-14, and 24-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 4.

Applicant's Response dated September 8, 2003

3. In the Response filed September 8, 2003, the specification and claims 3, 7-8, and 15 were amended. Applicant presented arguments directed to the rejection of 3-10, 15-18, and 20-21 under 35 U.S.C. 103(a). Claims 1-18, 20, 21, and 24-26 are pending. Claims 1, 2, 11-14, and 24-26 are drawn to a nonelected invention. An action on the merits of claims 3-10, 15-18, and 20-21 is contained herein below.

4. The rejection of claims 3-10, 15-18, and 20-21 under 35 U.S.C § 103(a) is maintained for the reasons of record set forth in the Office Action dated June 17, 2003.

Objections/Rejections of Record Set For the in Office Action dated June 26, 2002

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 3-10, 15-18, and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ronaghi et al. *Science*, (**1998**), vol. 281, pages 363-365 (Ronaghi) and Yeung et al. U.S. Patent 6,387,234 (Yeung).

Claims 3-10, 15-18, and 20-21 are drawn to a system to obtain DNA sequence information in which pyrophosphate produced upon synthesizing a strand complementary to a template DNA is converted into ATP which is reacted with luciferine in the presence of an enzyme and the complementary strand synthesis is monitored by detecting the resulting chemiluminescence, said system being characterized by comprising a means for supplying four kinds of dNTP into a reaction vessel via independent capillaries or narrow grooves which can be in contact with a reaction solution, by pressurizing or by a liquid transfer system.

Ronaghi teaches that natural nucleotides can be used to obtain efficient incorporation during a sequencing-by-synthesis protocol. The detection was based on the pyrophosphate (PPi) released during the DNA polymerase reaction, the quantitative conversion of PPi to ATP by sulfurylase, and the subsequent production of visible light by firefly luciferase. In the DNA sequencing method, four nucleotides are added stepwise to the template hybridized to a primer. The PPi released in the DNA polymerase-catalyzed reaction is detected by the ATP sulfurylase and luciferase in a coupled reaction. The added nucleotides are continuously degraded by a nucleotide-degrading enzyme. After the first nucleotide has been degraded, the next nucleotide can be added. Repeated cycles of deoxynucleotide addition are performed. The amount of light produced in the luciferase-catalyzed reaction can readily be estimated

by a suitable light-sensitive device such as a luminometer or a CCD (charge-coupled device) camera. With this method, parallel processing of large numbers of samples can easily be envision with the use of high-density microtiter plates and microinjector technology. An automated instrument has recently been developed based on the precise delivery of submicroliter volumes of the four nucleotides by "ink-jet" technology into a microtiter plate coupled with simultaneous detection of all samples by a single CCD unit.

Ronaghi differs from the instantly claimed invention in that: 1) Ronaghi does not teach how the dNTP is supplied and 2) Ronaghi does not teach the dimensions of the caplillaries. However, these deficiencies would have been obvious to one of ordinary skill in the art when Ronaghi is combined with Yeung.

Yeung teaches an integrated multiplexed capillary electrophoresis system for the analysis of sample analytes. The system integrates and automates multiple components, such as chromatographic columns and separation capillaries, and further provides a detector for the detection of analytes eluting from the separation capillaries (Abstract). The system employs multiplexed freeze/thaw valves to manage fluid flow and sample movement. The system contains a plurality of intake capillaries, each intake capillary in fluid communication with one of a plurality of first junctions (column 2, lines 61-67). The detector comprises a charge-coupled device (CCD) or a charge-injection device (CID) (column 6, lines 60-62). Yeung further teaches the use of said system for sequencing nucleic acids.

It would have been obvious to one of ordinary skill in the art at the time of the invention to supply the dNTP via capillaries using a liquid transfer system since Yeung teaches such. The choice of using capillaries 0.2 mm in diameter is well within the purview of the skilled artisan and is seen as a choice of experimental design. The capillary diameter is not a result-effective variable. In the absence of evidence to the contrary, the skilled artisan would have a reasonable expectation of success in obtaining a DNA sequence utilizing capillaries of 0.5 or 0.2 mm. Thus, the instantly claimed system is prima facie obvious.

Response to Arguments

7. Applicant's arguments filed September 8, 2003, have been fully considered but they are not persuasive.

Applicant argues that neither Ronaghi nor Yeung teaches or suggests "means for supplying four different kinds of dNTPs into each reaction vessel via independent capillaries or grooves by pressurizing or a liquid transfer system while each of the capillaries or the grooves corresponds to one of said different kinds of dNTPs." Applicant's arguments are not convincing in view of that which the prior art teaches as a whole.

Yeung teaches an integrated multiplexed capillary electrophoresis system for the analysis of sample analytes. The system integrates and automates multiple components, such as chromatographic columns and separation capillaries, and further provides a detector for the detection of analytes eluting from the separation capillaries

(Abstract). The system contains a plurality of intake capillaries, each intake capillary in fluid communication with one of a plurality of first junctions (column 2, lines 61-67; column 6). The intake capillaries provide a "means for supplying dNTPs." Samples are pumped through a first plurality of joining capillaries which connect the T-assembly with the chromatographic column array having individual chromatographic columns. The number of intake capillaries employed in the system is directly related to the number of sample analysis "channels" in the system. Each intake capillary may also comprise a reaction portion (column 8, lines 9-65). The system most preferably contains at least 1000 intake capillaries. The exact nature of the composition supplied by the capillaries is seen as a choice of experimental design.

In the absence of some proof of a secondary nature to obviate the rejection as set forth in the Office Action dated June 17, 2003, or of some specific limitations which would tip the scale of patentability in the favor of the instantly claimed invention, it would have been obvious to one of ordinary skill in this art at the time of the invention to supply dNTPs employing the integrated multiplexed capillary electrophoresis system of Yeung.

Conclusion

8. Claims 1-18, 20, 21, and 24-26 are pending. Claims 1, 2, 11-14, and 24-26 are drawn to a nonelected invention. Claims 3-10, 15-18, and 20-21 are rejected. No claims are allowed.

9. This application contains claims 1, 2, 11-14, and 24-26 drawn to an invention nonelected without traverse in Paper No. 4. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contacts

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick T. Lewis whose telephone number is 703-305-4043. The examiner can normally be reached on M-F 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703-308-4624. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 for regular communications and 703-305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

Patrick T. Lewis, PhD
Examiner
Art Unit 1623

James O. Wilson
Supervisory Patent Examiner
Technology Center 1600

ptl
November 15, 2003